

Claims

[c1] 1. A method for forming a profile of a radius of the interior of a reformer tube comprising the steps of;
projecting a light beam on an interior surface of said reformer tube;
collimating said light beam to focus on the surface of said reformer tube;
forming said collimated beam into a ring on the surface of said reformer tube;
projecting an image of said ring onto a surface of a light detector and moving said ring along an axis of said reformer tube;
detecting light reflected from the surface of said reformer tube;
processing reflected light data collected by the detector;
and
forming a radius profile.

[c2] 2. The method for forming a profile of the radius of the interior of a reformer tube according to Claim 1, further comprising the step of reflecting the light beam off of a conical mirror surface.

[c3] 3. The method for forming a profile of the radius the in-

terior of a reformer tube according to Claim 2, wherein the conical mirror further includes a parabolic surface for maintaining focus of the light beam on expected reformer tube diameter.

- [c4] 4. The method for forming a profile of the radius of the interior of a reformer tube according to Claim 3, further comprising the steps of, reflecting the light beam off a mirror, and rotating said mirror to produce a ring of light on the surface of said tube.
- [c5] 5. The method for forming a profile of the radius of the interior of a reformer tube according to Claim 3, further comprising the steps of, reflecting the light beam off the surface of said reformer tube, and rotating a light source to produce a ring of light on the surface of said reformer tube.
- [c6] 6. The method for forming a profile of the radius of the interior of a reformer of a reformer tube according to Claim 4, wherein the light source is at least one of an LED, and a laser.
- [c7] 7. The method for forming a profile of the radius of the interior of a reformer of a reformer tube according to Claim 5, wherein the light source is at least one of an LED, and a laser.

- [c8] 8.The method for forming a profile of the radius of the interior of a reformer tube according to Claim 1, further comprising the steps of, reflecting said beam off the surface said reformer tube, and rotating an LED to produce a ring of light on the surface of said reformer tube.
- [c9] 9.The method for forming a profile of the radius of the interior of a reformer tube according to Claim 1, wherein the light beam is focused on an interior axis of said reformer tube.
- [c10] 10.The method for forming a profile of the radius of the interior of a reformer tube according to Claim 9, further comprising the step of reflecting said beam off the surface of a conical mirror.
- [c11] 11.The method for forming a profile of the radius the interior of a reformer tube according to claim 9, further comprising the step of reflecting said beam off the surface of the conical mirror with a parabolic surface for maintaining focus of said beam on the expected reformer tube diameter.
- [c12] 12.The method for forming a profile of the radius of the interior of a reformer tube according to Claim 9, further comprising the steps of, reflecting said beam off a mirror, and rotating said mirror to produce a ring of light on

the surface of said tube.

- [c13] 13. The method for forming a profile of the radius of the interior of a reformer tube according to Claim 9, further comprising the steps of, reflecting said beam off the surface said reformer tube, and rotating an LED to produce a ring of light on the surface of said reformer tube.
- [c14] 14. The method for forming a profile of the radius of the interior of a reformer tube according to Claim 9, further comprising the steps of, reflecting said beam off a mirror at the surface said tube, and rotating an LED to produce a ring of light on the surface of said reformer tube.
- [c15] 15. The method for forming a profile of the radius of the interior of a reformer tube according to Claim 9, further comprising the steps of, reflecting said light beam off the surface said reformer tube, and rotating an LED to produce a ring of light on the surface of said reformer tube.
- [c16] 16. A method for forming a profile of a radius of the interior of a reformer tube comprising the steps of;
projecting a light beam on an interior surface of said reformer tube;
collimating said light beam to focus on the surface of said reformer tube;

rotating at least one of the light source and a mirror to scan the interior surface of the reformer tube; detecting light reflected from the surface of said reformer tube; processing reflected light data collected by the detector; and forming a radius profile.